

# CMOS-MEMS Microgravity Accelerometer with High-Precision DC Response, Phase II

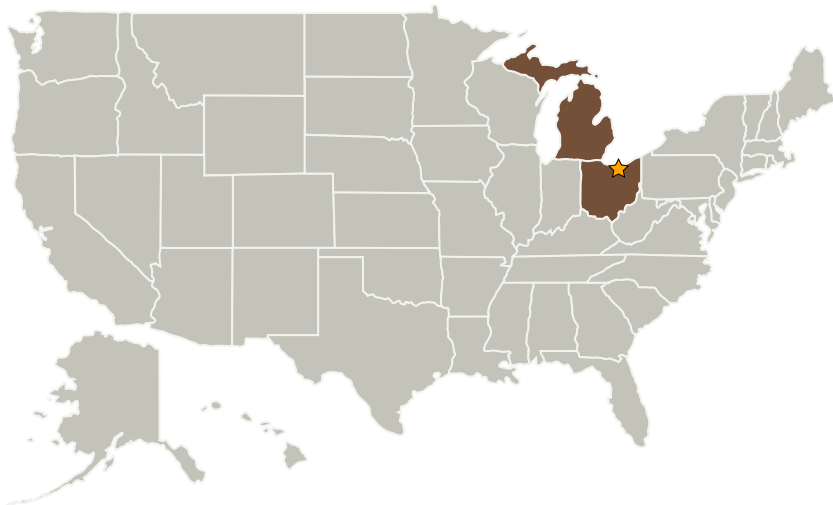
Completed Technology Project (2005 - 2007)



## Project Introduction

In this Phase II SBIR project a high-sensitivity low-noise all-silicon CMOS-MEMS accelerometer for quasi-steady measurements of accelerations at sub 1 micro-g levels will be developed. The outcome of the project is a capacitive microaccelerometer with a resolution of 90ng/sqrt-Hz over +/-0.1g range for Type A sensor and 0.8ug/sqrt-Hz over +/-1g for Type B sensor with programmable bandwidth from DC to programmable 0.1Hz-100Hz. The accelerometer module includes integrated low-noise CMOS circuitry with active offset and low-frequency noise cancellation to enable high-precision DC measurements. The high-performance of the sensor is enabled by innovation in both MEMS accelerometer and readout circuit technologies: i) Single-crystalline silicon capacitive accelerometer structure. The device has high sensitivity and low thermo-mechanical noise; ii) Innovative high-yield fabrication process that enables formation of high-sensitivity devices on top of CMOS wafers; iii) New and improved low-noise capacitive sensor readout CMOS circuit. This novel microaccelerometer has several NASA applications including measurement of residual accelerations on spacecraft and ground-based low-gravity facilities.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Glenn Research Center (GRC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Evigia Systems, Inc.	Supporting Organization	Industry	Ann Arbor, Michigan

Primary U.S. Work Locations	
Michigan	Ohio

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX17 Guidance, Navigation, and Control (GN&C)
  - └ TX17.2 Navigation Technologies
    - └ TX17.2.3 Navigation Sensors